

### AMENDMENTS TO THE CLAIMS

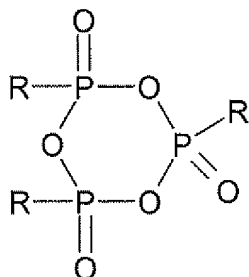
Claims 1-21 (Cancelled)

22. (New) A proton-conducting polymer membrane based on polyazoles which can be obtained by a process comprising the steps of

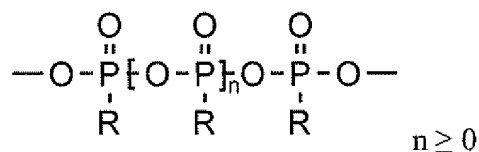
- A) dissolving the polyazol-polymer in organic phosphonic anhydrides with formation of a solution and/or dispersion,
- B) heating the solution obtainable in accordance with step A) under inert gas to temperatures of up to 400°C,
- C) forming a membrane using the solution of the polyazole polymer in accordance with step B) on a support and
- D) treatment of the membrane formed in step C) until it is self supporting.

23. (New) The membrane according to claim 22, wherein in step B) said heating is up to 300°C.

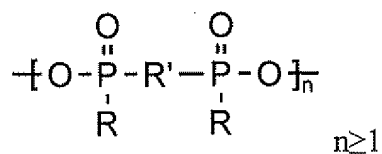
24. (New) The membrane according to claim 22, wherein in step A), phosphonic anhydrides of the formula



or linear compounds of the formula



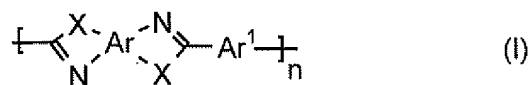
or anhydrides of the multiple organic phosphonic acids of the formula



wherein the radicals R and R' are identical or different and represent a C<sub>1</sub>-C<sub>20</sub> carbon-containing group.

25. (New) The membrane according to claim 22, which further comprises in step A), a polyphosphoric acid having a content of at least 83%, calculated as P<sub>2</sub>O<sub>5</sub> (by acidimetry).
26. (New) The membrane according to claim 22, which further comprises in step A), P<sub>2</sub>O<sub>5</sub>.
27. (New) The membrane according to claim 22, wherein in step A), B) or step C), a solution or a dispersion/suspension is produced.
28. (New) The membrane according to claim 22, wherein the polymer used in step A) contains recurring azole units of the general formula (I) and/or (II)

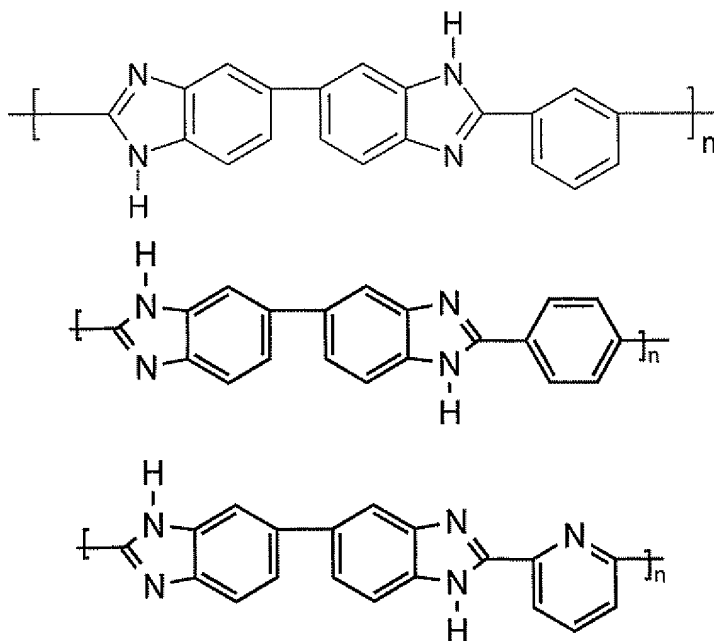
wherein

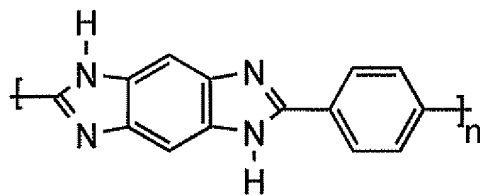
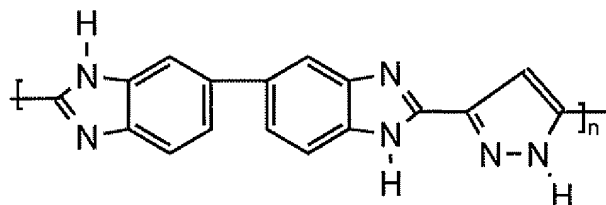
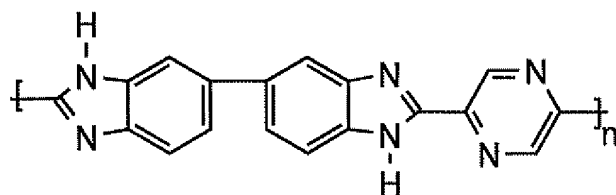
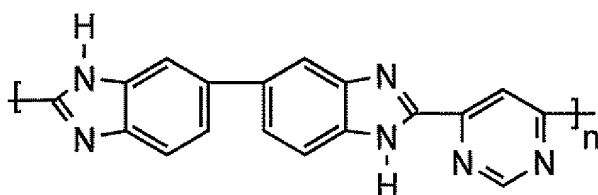
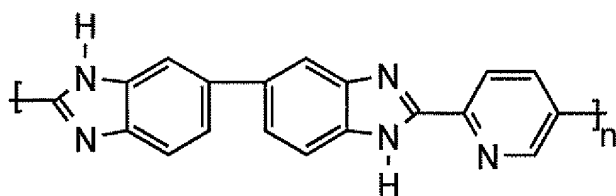
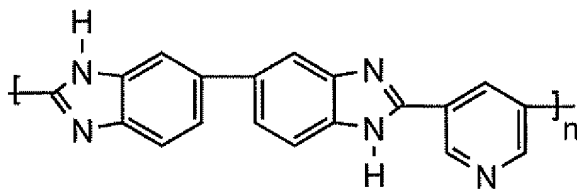


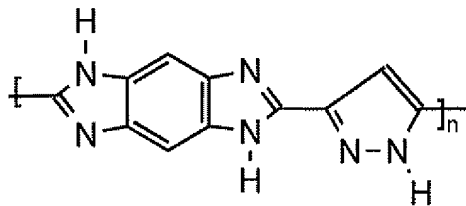
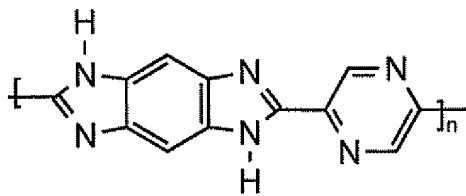
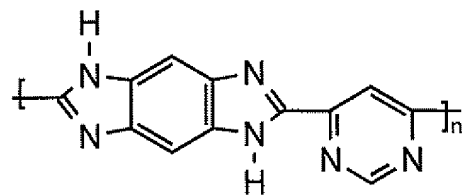
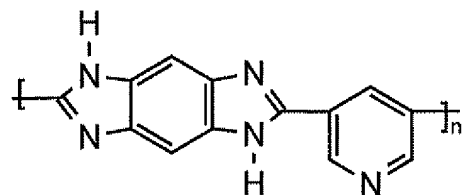
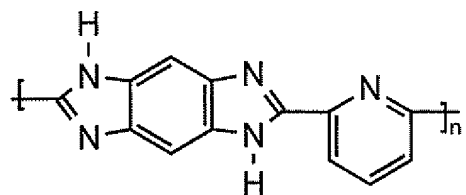
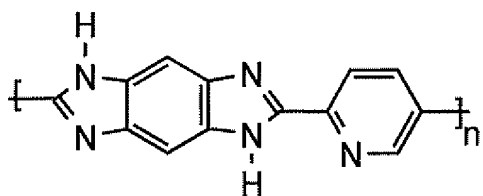
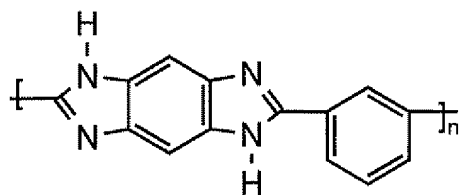
Ar are identical or different and represent a tetravalent aromatic or heteroaromatic group

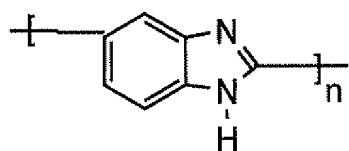
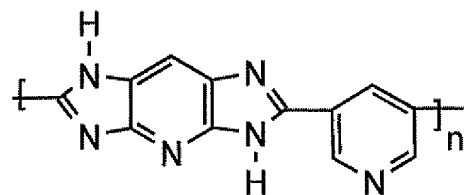
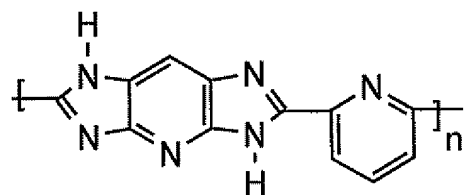
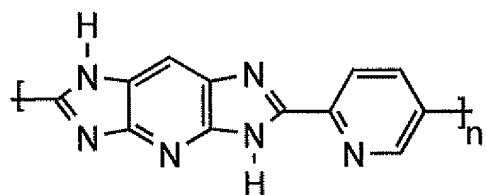
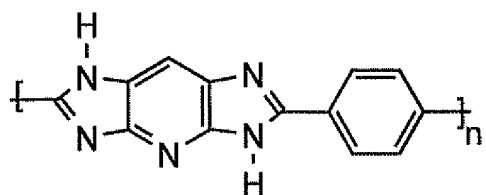
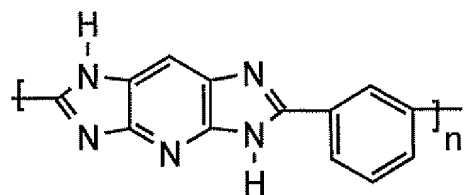
- which can be mononuclear or polynuclear,
- Ar<sup>n</sup> are identical or different and represent a bivalent aromatic or heteroaromatic group which can be mononuclear or polynuclear,
- Ar<sup>2</sup> are identical or different and represent a bivalent or trivalent aromatic or heteroaromatic group which can be mononuclear or polynuclear,
- X are identical or different and represent oxygen, sulphur or an amino group which carries a hydrogen atom, a group having 1 - 20 carbon atoms, preferably a branched or unbranched alkyl or alkoxy group, or an aryl group as a further radical.

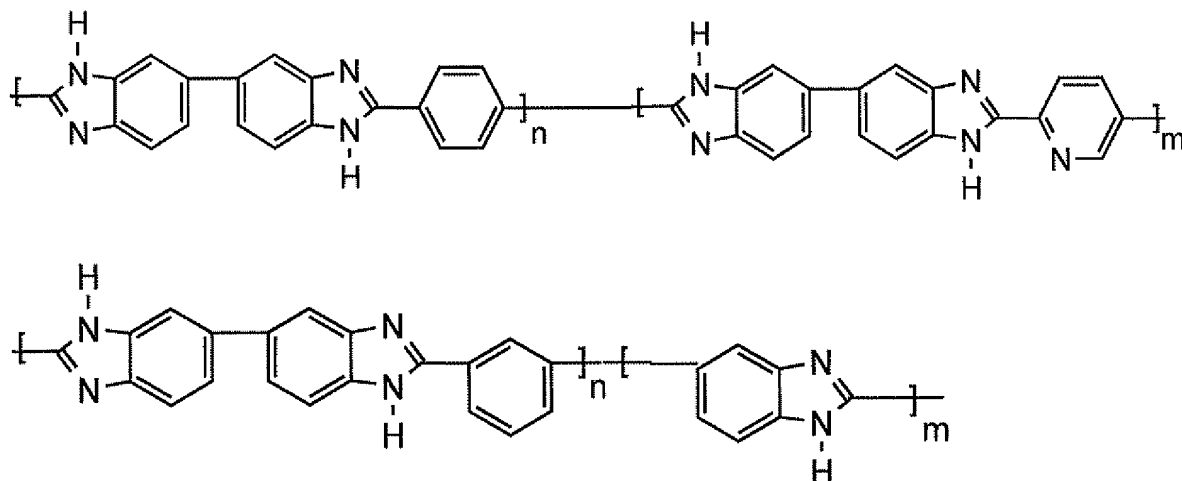
29. (New) The membrane according to claim 22, wherein, in step A), the polymer selected from the group consisting of polybenzimidazole, poly(pyridines), poly(pyrimidines), polyimidazoles, polybenzothiazoles, polybenzoxazoles, polyoxadiazoles, polyquinoxalines, polythiadiazoles and poly(tetrazapyrenes) is used.
30. (New) The membrane according to claim 22, wherein in step A), the polymer used contains one or more recurring benzimidazole units of the formula











where  $n$  is an integer greater than or equal to 10.

31. (New) The membrane according to claim 22, wherein, before, during or after step A) and/or other step B) or before step C), a further polymer is added as blend material.
32. (New) The membrane according to claim 22, wherein, before step D), the viscosity is adjusted by addition of phosphoric acid and/or organophosphonic acids.
33. (New) The membrane according to claim 22, wherein the membrane produced in accordance with step C) is treated in the presence of moisture at temperatures and for a period of time until the membrane is self-supporting and can be detached from the support without any damage.
34. (New) The membrane according to claim 22, wherein the treatment of the membrane in step D) is performed at temperatures of more than  $0^{\circ}\text{C}$  and less than  $150^{\circ}\text{C}$ , in the presence of moisture or water and/or steam.
35. (New) The membrane according to claim 22, wherein the treatment of the membrane in step D) is performed at temperatures of more than  $20^{\circ}\text{C}$  and less than  $90^{\circ}\text{C}$ , in the presence

of moisture or water and/or steam.

36. (New) The membrane according to claim 22, wherein the treatment of the membrane in step D) is for 10 seconds to 300 hours.
37. (New) The membrane according to claim 22, wherein, in step C), an electrode is chosen as the support and the treatment in accordance with step C) is such that the membrane formed is no longer self-supporting.
38. (New) The membrane according to claim 22, wherein, in step C), a layer having a thickness of 20 to 4,000 pm, is produced.
39. (New) The membrane according to claim 22, wherein the membrane formed in step D) has a thickness between 15 and 3,000  $\mu\text{m}$ .
40. (New) An electrode having a proton-conducting polymer coating based on polyazoles which can be obtained by a process comprising the steps of
- A) dissolving the polyazol-polymer in organic phosphonic anhydrides with formation of a solution and/or dispersion,
  - B) heating the solution obtainable in accordance with step A) under inert gas to temperatures of up to 400<sup>0</sup>C,
  - C) forming a membrane using the solution of the polyazole polymer in accordance with step B) on an electrode and
  - D) treatment of the layer formed in step C).
41. (New) The electrode according to claim 40, where the coating has a thickness between 2 and 3,000  $\mu\text{m}$ .
42. (New) A membrane electrode unit containing at least one electrode and at least one membrane according to claim 39.
43. (New) The membrane electrode unit containing at least one electrode according to claim 40.
44. (New) A fuel cell containing one or more membrane electrode units according to claim



claim 43.